REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following remarks is respectfully requested.

Claims 8-20 and 22 are active in this application. Claims 1-7, 21 and 23-106 having been withdrawn from consideration as directed to a non-elected invention.

In the outstanding Office Action the title was objected to as not being descriptive, Claims 8-13, 17-20 and 22 were rejected under 35 USC §103(a) as being unpatentable over Dynka et al., (U.S. Patent No. 5,697,825, hereinafter called "Dynka") in view of Roberson (U.S. Patent No. 3,748,543), and Claims 14-16 were rejected under 35 USC §103(a) as being unpatentable over Dynka in view of Roberson in further view of Watkins et al. (U.S. Patent No. 5,827,102, hereinafter called "Watkins").

In response to the objection to the title, the title has been amended to adopt the title suggested in the outstanding Official Action, and accordingly, this ground for objection is believed to have been overcome.

Applicants respectfully traverse the outstanding grounds for rejection on the merits, because in Applicants' view, the pending active claims patentably define over the cited references, as next discussed.

Briefly recapitulating, pending Claim 8 recites: a method of manufacturing an image display apparatus which comprises an envelope having a front substrate and a rear substrate opposed to each other and individually having peripheral edge portions sealed together, including the steps of:

> arranging an electrically conductive sealing member along a sealed portion between the respective peripheral edge portions of the front substrate and the rear substrate; and
>
> sealing the sealed portion by supplying current to and melting the sealing member.

By virtue of the claimed manufacturing method, heat is mainly applied only to the conductive sealing member which is heated and melted by heat that is generated as current is supplied to the conductive sealing member. If the current supply is stopped immediately after the sealing member is melted, heat from the sealing member is quickly diffusively conducted to the front substrate and the rear substrate, whereupon the sealing member is cooled and solidified. Thus, the claimed sealing method requires no heating device for generally heating the front substrate and the rear substrate, and moreover, the time for the sealing process can be shortened considerably. In addition, since little heating of the front and rear substrates occurs, thermal expansion of the front substrate and the rear substrate can be minimized, so that lowering of the positional accuracy of the substrates can be improved as they are sealed together.[1]

In contrast to the claimed invention, Dynka only discloses a basic structure of a display apparatus, and teaches a conventional method for sealing an image display apparatus. In the sealing process as taught by Dynka, the entire substrate is heated (by heating source 80) and increased in temperature, and a sealing material is melted. Then, the sealing material is cooled and solidified to seal the substrate. In the Dynka method, because the whole substrate is heated and is cooled, warping of the substrate often occurs, and if the substrate is an oversized substrate as used for a display apparatus, it is even more difficult to evenly heat and cool the substrate. Even then, heating and cooling must be carried out slowly to suppress a rapid change in the temperature. Thus it is seen that the conventional sealing process as taught by Dynka has several disadvantages, namely: (i) a warp often occurs in the substrate; and (ii) a sealing process (of a large substrate, in particular) requires a long time. In view of these disadvantages and in view of the acknowledgement at lines 12-13 of paragraph 7 of the

[1] See the specification, page 6, lines 7-23, and page 21, line 20 top page 27, line 8, for corresponding explanation.

outstanding Official Action that Dynka fails to disclose supplying current to and melting a sealing member, it is respectfully submitted that pending Claim 8 clearly patentably defines over Dynka.

In the present invention, as stated above, since an electrically conductive sealing material is melted and solidified by current-supply heating, the temperature of the whole substrate changes little. Thus, the above-stated warp of the substrate can be prevented from occurring. In addition, only the sealing member requires heating and cooling, and therefore sealing can be carried out in a short time. Moreover, the substrate is not directly heated (does not increase in the temperature), and heat from the sealing material is quickly diffusively conducted to the substrate side during cooling. Thus, cooling can be carried out in a short time.

Roberson discloses a technique of sealing a semiconductor package; however, the semiconductor package disclosed in Roberson pertains to a technical field which is completely different from the display apparatus of the present invention in size, heating characteristics, and so forth. That is, the semiconductor package disclosed in Roberson has a much smaller sealing member and substrate as compared to those of a display apparatus, and does not consider at all the above-stated problems (occurrence of a warp in the substrate, and necessity of a long time for cooling) which are peculiar to an oversize substrate used for a display apparatus.

In addition, Roberson uses the term "high voltage melting" as an alternative sealing mechanism, but Roberson fails to disclose what technique is specifically referred to by "high voltage melting." Thus, it is not at all clear that Roberson suggests an electrically conductive sealing material is melted and solidified by current-supply heating, as claimed. Further, Roberson does not disclose or suggest an application of the "high voltage melting" technique

to sealing of a display apparatus. Thus, in view of the significant differences in scale, it is not at all clear that the vague "high voltage melting" of Roberson is applicable to sealing of a display apparatus insofar as there is no reasonable expectation of success suggested by Roberson that the vaguely described "high voltage melting" could be used to advantage in the sealing of a display apparatus.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

It is respectfully submitted that the cited references fail to meet the criteria necessary to support a finding of obviousness. First, in view of the lack of explanation in Roberson as to what is meant by "high voltage melting/heating," it is respectfully submitted that neither applied reference teaches an electrically conductive sealing material is melted and solidified by current-supply heating, as claimed. As above noted, there is no teaching in the cited references that the small scale application of "high voltage melting/heating" would be useful or have a likelihood of success for use sealing a display apparatus which is of a much larger scale. In other words, Roberson does not disclose or suggest at all application of its semiconductor package "high voltage melting/heating" technique to sealing of a display apparatus. Instead, Roberson's disclosed sealing technique is but an isolated teaching existing in a non-analogous art, and it is respectfully submitted that absent hindsight, there is

no motivation provided in these references themselves to employ Roberson's disclosed sealing technique in the fabrication of a Dynka display apparatus.

Furthermore, it is noted that in determining the differences between the prior art and the claims, the question under 35 U.S.C. §103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); Schenck v. Nortron Corp., 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983). It is respectfully submitted that, in view of the noted deficiencies in the cited art, when considering the claimed invention "on the whole," it is not proper to compare isolated claimed features with purportedly similar features in individual references, as appears to be the present situation.

In light of the above comments, it is respectfully submitted that a person skilled well in the art would not be led to replace the conventional sealing technique of a display apparatus taught by Dynka with the semiconductor package sealing technique disclosed by Roberson, in order to resolve the problem peculiar to an oversized substrate as encountered during fabrication of a display apparatus. Accordingly, it is respectfully submitted that the combination of Roberson and Dynka is not possible absent hindsight, which of course is not a proper basis for rejection under 35 USC §103, and that the outstanding rejection of Claim 8 and Claims 9-13, 17-20 and 22 dependent therefrom is traversed..

Pending Claims 17 and 18 recite the method step of setting the temperature of the front substrate and the rear substrate to be lower than the melting point of the sealing member at a point of time immediately before supplying current to the sealing member.

Dynka's sealing process results in the whole of the front and rear substrates being heated. No provision is disclosed to set the temperature of the front substrate and the rear

substrate to be lower than the melting point of the sealing member. Thus, it is respectfully submitted that Dynka does not disclose or obviate the subject matter recited in Claims 17-18.

Pending Claim 14 recites a feature that: the sealing member is arranged in the form of a frame along the sealed portion on the peripheral edge of the envelope and is formed having two electrode portions protruding outward from the sealed portion, the sealing member being supplied with current through the electrode portions. The outstanding Official Action states the finding that conductive traces 54 illustrated in FIG. 1 of Watkins. correspond to the electrodes stated in Claim 14. Applicants respectfully disagree.

In Watkins, a sealed portion 22 connected to conductive traces 54 is made from glass (frit seal) and does not have conductivity. As is clear from FIG. 1A, conductive traces 54 are connected to bonding pads 56 via wiring 58, and do not contribute at all to energization of sealed portion 22. Accordingly, it is respectfully submitted that the outstanding ground for rejection of Claims 14-16 is further traversed.

Consequently, in view of the above comments, the pending Claims 8 -13, 17-20 and 22 are believed to be patentably distinguishing over the cited art and in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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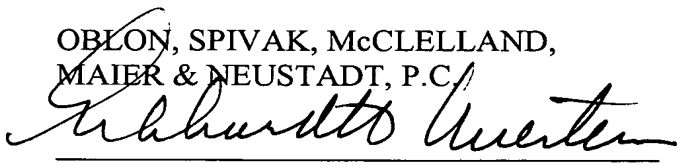

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